

CLAIMS

1. A silicon wafer, which is obtained from a silicon single crystal grown by the Czochralski method in a hydrogen-containing inert gas atmosphere,

5 the silicon wafer being a completely grown-in defect-free wafer containing no COPs or dislocation clusters throughout the wafer in the thickness and radial directions thereof, and

all the portions thereof consisting essentially of an interstitial rich region.

10 2. The silicon wafer according to claim 1, wherein the silicon wafer has uniform distributions in oxygen precipitate density, oxygen precipitate size and DZ width in the in-plane direction of the silicon wafer.

3. A method for growing silicon single crystals, the method comprising:

15 pulling a silicon single crystal by the CZ method in a hydrogen-containing inert gas atmosphere so as to expand the range of the pull rate for the PI region at which a single crystal containing no COPs or dislocation clusters throughout the crystal in the radial direction thereof and having an interstitial rich region can be pulled,

 wherein the pulling of the silicon single crystal is conducted at a pull rate within
20 this expanded range of the pull rate for the PI region so as to grow a grown-in defect-free silicon single crystal having a body portion that is an interstitial rich region.

4. The method for growing silicon single crystals according to claim 3, wherein the range of the pull rate for the PI region in a hydrogen-containing inert gas atmosphere is
25 expanded to at least twice the range in an inert gas atmosphere which contains no

hydrogen.

5. The method for growing silicon single crystals according to claim 3, wherein a plurality of single crystals are pulled at a pull rate within the range of the pull rate for the

5 PI region.

6. The method for growing silicon single crystals according to claim 3, wherein the composition of the hydrogen-containing inert gas atmosphere is set so that the hydrogen concentration V_H (vol %), air concentration V_{Air} (vol %) and argon concentration V_{Ar}

10 (vol %), when indicated as points (V_H , V_{Ar} , V_{Air}) in appended FIG. 12, are values which lie within a non-combustion range enclosed by point A (100, 0, 0), point B (0, 100, 0), point C (0, 0, 100), point D (4, 0, 96), point E (4, 84, 12) and point F (75, 0, 25).

7. A method for manufacturing silicon wafers, the method comprising: slicing wafers

15 from a single crystal grown by the method for growing silicon single crystals of claim 3.

8. The method for manufacturing silicon wafers according to claim 7, wherein the method further comprises an annealing treatment.